

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Revision of Part 15 of the Commission's Rules)	ET Docket No. 98-153
Regarding Ultra-Wideband Transmission Systems)	
_____)	

SPRINT REPLY COMMENTS

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Executive Summary

Sprint does not oppose ultra-wideband (“UWB”) technology *carte blanche*, and it recognizes that certain niche UWB applications, some with life-saving potential, may be warranted. However the Commission must proceed much more cautiously with mass-market UWB systems that would disrupt authorized services. It is premature to begin dismantling the system of frequency allocation that has served this country so well for over 70 years.

Despite claims of “bandwidth from thin air,”¹ UWB technology imposes real costs in terms of harmful interference. As noted by Dr. Robert Scholtz of the Communication Sciences Institute of the University of Southern California, “there must be a real payoff in the use of impulse radio to undertake the difficult problem of coexistence with a myriad of other radio systems.”² UWB proponents have not yet satisfactorily demonstrated this payoff.

Approval of UWB operation below 3 GHz runs at least two risks. One, UWB use of this spectrum may be entirely unnecessary for many of the applications envisioned. Continual progress in processing power (Moore’s Law), miniaturization, and battery life have established grounds for optimism, not pessimism, for so called “conventional” (frequency domain) approaches to wireless communications. Wireless home networks are on the market now and are dropping rapidly in price, and in a few years these devices will become even more powerful and cost effective. In addition, developments such as Lucent’s

¹ See *The Economist*, “Bandwidth from Thin Air,” at 85 (Nov. 6, 1999).

BLAST show that exciting and unexpected breakthroughs — even “paradigm shifts” — in wireless communications can be obtained without resorting to wholesale interference with authorized services.

Future breakthroughs in UWB technology itself may allow UWB systems to “move up” the spectrum, entirely avoiding the overcrowded regions below 3 GHz. Many sensing and radar applications envisioned for UWB will operate entirely above 3 GHz; communications systems will likely follow suit, as some UWB proponents acknowledge. Due to attenuation, use of higher (not lower) frequencies would appear appropriate if UWB is targeted for short (not long) distance communications.

It is also relevant to note that UWB is not a single technology but a potentially huge class of technologies, many of which no doubt lie undiscovered and unpatented. Only a handful of vendors are developing UWB at present, but the technology’s approval would undoubtedly bring a flood of new participants with new ideas. The Commission should direct industry energy and ingenuity toward developing UWB solutions in the right place in the spectrum for effective non-interfering use — namely, in the regions above 3 GHz. Existing UWB technologies may or may not be able to satisfy this requirement, but this should not deter the Commission from making the right decision for long term stewardship of the spectrum.

Finally, the Commission needs to consider the serious legal issues raised by this rulemaking. Sprint, as well as other companies, has paid the U.S. Treasury billions of dollars to acquire its spectrum, expended millions more clearing the spectrum for use, and

² Robert A. Scholtz and Moe Z. Win, “Impulse Radio,” at 246, Invited Paper, IEE PIMRC’97 – Helsinki, Finland, *available at* <http://ultra.usc.edu/ulab/index.html>.

has invested billions more in building state-of-the-art wireless networks. These investments were made with the understanding that a licensee's use of its licensed spectrum was exclusive. In these circumstances, the Commission cannot permit others to use Sprint's spectrum for free or to require Sprint to redesign its networks in order to accommodate other users of its spectrum. This is particularly so when the Commission has proposed to allow others to use Sprint spectrum to provide telecommunications services that may compete with Sprint's own services.

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Sprint Corporation, on behalf of its local, long distance, and wireless divisions (collectively, "Sprint"), submits these reply comments in this rulemaking proceeding addressing ultra-wideband ("UWB") technology.

Sprint continues to support UWB as a promising technology. The UWB industry, however, has not met its burden of demonstrating that UWB devices, as currently designed, do not cause harmful interference to existing authorized services. Specifically, UWB devices pose a threat to existing PCS and MMDS operations. Moreover, the subject of UWB raises serious legal issues regarding the rights of existing license holders.

I. The Commission Should Reaffirm That All Licensees Are Entitled to Protection from Harmful Interference

Several UWB proponents acknowledge their obligation to prevent harmful interference to existing licensees,³ and for this reason several further recommend that the Commission not permit UWB usage in the bands below 2-3 GHz — at least until addi-

³ See, e.g., XtremeSpectrum at 4 ("No one in the ultra-wideband community disputes the need to protect other [radio] users."); Multispectral Solutions at 11.

tional interference analysis is completed.⁴ Other UWB proponents, however, suggest that licensees outside the restricted bands are not entitled to interference protection.⁵

The Commission should reiterate that *all licensees*, including those using spectrum outside the restricted bands, are entitled to protection from harmful interference.⁶ It should further reiterate that UWB proponents hold the burden of demonstrating “conclusively” that their proposed service will entail “no potential for interference” to existing licensees.⁷ As the Commission has previously stated:

The burden of proof is on the applicants and unless it has been shown affirmatively that either or both of the proposed antenna systems will function without the hazard of interference, the burden has not been sustained.⁸

⁴ See, e.g., Multispectral Solutions at 1 (Unfiltered UWB systems “should not be permitted under Part 15,” and filtered systems should initially be permitted only “above 3.1 GHz.”); at 13 (“[T]here is no compelling reason to operate below 3.1 GHz for the types of applications contemplated for UWB communications and radar.”); Delphi at 18 (“[T]he Commission should not attempt to make a determination regarding frequency of operation below 2 GHz until adequate testing of interference potential has been performed.”); Fantasma at 3 (“Fantasma agrees with the Commission’s concerns relating to the operation of UWB systems on or near frequencies used for GPS services.”); Zircon at 7 (“It is possible that UWB devices used for communications purposes . . . may have some interference potential to radio services operating below 2 GHz.”).

⁵ See, e.g., Time Domain at 29-30 (“Certainly, the UWB community wants to protect the restricted bands.”).

⁶ See *UWB NPRM* at 7 (“[W]e recognize that any new rule provisions for UWB devices must ensure that radio services are protected against interference.”); at ¶ 8 (“[W]e conclude that the Commission should develop reasonable regulations that will foster the development of UWB technology while continuing to protect radio services against interference.”); at ¶ 27 (“[W]e believe that we should establish as few restrictions as possible on the operating frequencies, except as necessary to protect existing services against interference.”); at ¶ 31 (Additional testing “will be important for developing emission limits for UWB devices that will protect other radio services against interference.”).

⁷ See *New Channels Communications*, 57 R.R.2d 1600 ¶ 6 (1985) (“The burden of demonstrating that there is no potential for interference rests with the applicant.”); *Non-Geostationary Satellite Orbit Fixed-Satellite Service*, 14 FCC Rcd 1131, 1180 ¶ 98 (1998) (“[W]e believe that Northpoint has not provided sufficient information or analysis to demonstrate conclusively that its technology could not cause harmful interference to DBS.”).

⁸ *Cosmopolitan Enterprises*, 15 F.C.C.2d 659, 674 No. 4 (1967). See also *AirCell*, 15 FCC Rcd 9622 ¶ 18 (May 24, 2000) (“AirCell was required to make an affirmative showing that its system is

II. The GPS/UWB Tests Should Include an Impact Analysis of GPS Chipsets and Other E911 Location Technologies

The Commission has appropriately noted that our GPS system is a national treasure deserving of special interference protection.⁹ It has further observed that several UWB interference tests are planned for the GPS system.¹⁰ Sprint believes that it is imperative that these or future tests include an evaluation of the Qualcomm GPS handset and other E911 location technologies.

The Commission has required mobile carriers to meet certain precise location capabilities in connection with E911 calls, and a GPS-assisted handset solution appears to be the most promising solution for CDMA carriers.¹¹ Qualcomm, the CDMA patent holder, has developed techniques “to enhance the sensitivity of GPS receivers” in order to permit GPS-equipped handsets to work “under more severe shadowing conditions compared to conventional GPS receivers” and as a result, enable CDMA licensees “to meet or exceed the [FCC’s] accuracy requirements.”¹² Qualcomm expresses “concern” that UWB interference “will potentially harm the operation of [these GPS] phones during E9-1-1 calls.”¹³

Qualcomm’s comments demonstrate the critical need for UWB interference to be evaluated not only with respect to GPS generally, but also with regard to the more sensi-

not likely to cause harmful interference to terrestrial cellular operations.”); *Waynesboro Broadcasting*, 1 F.C.C.2d 431, 432-33 ¶ 3 (1965)(“[T]he burden of proof is upon the applicants to show that interference will not be caused to the [existing] installation by their proposals.”); *Industrial Communications*, 6 FCC Rcd 264, 265 ¶ 12 (1990)(“It is the burden of the applicant to demonstrate interference-free operation.”).

⁹ See *UWB NPRM* at ¶¶ 7, 24, 28, 29, and 39.

¹⁰ See *id.* at ¶ 31.

¹¹ See *Third E911 Order*, 14 FCC Rcd 17388, 17401 ¶ 26 (1999).

¹² Qualcomm at 2 and 4.

¹³ *Id.*

tive GPS chipsets that Qualcomm is developing so that CMRS licensees can meet existing Commission requirements.

III. The Commission Has Correctly Concluded That UWB Devices Should Not Be Regulated Like a Hairdryer or a Personal Computer

Some (but not all) UWB proponents assert that the Commission should approve UWB devices in any licensed spectrum band using the emission levels set forth in the current Part 15 rules. These UWB proponents make a simple and superficially attractive argument in support of their position:

- UWB intentional emitters will operate at power levels equal to or below the Part 15 limits;
- Current unintentional Part 15 devices do not cause harmful interference today; and
- Therefore, UWB emitters should be permitted under current Part 15 emission levels.¹⁴

The Commission has rejected this “UWB devices are just like unintentional radiators” argument,¹⁵ and the comments persuasively demonstrate the validity of the Commission’s conclusion.¹⁶

There are many differences between UWB devices, on the one hand, and unintentional radiators, the conventional Part 15 devices mentioned above, on the other hand. Devices such as a hairdryer or vacuum cleaner are used intermittently and when in use, the operator rarely makes a telephone call with his or her mobile handset. In contrast, many UWB applications would be designed to operate frequently or even continuously, and it is

¹⁴ See, e.g., Time Domain at 8-9.

¹⁵ See *UWB NPRM* at 40.

¹⁶ See, e.g., Cisco at 6-7; GPS Council at 29-30 and 43-44; Metricom at 3-6; Nortel at 7-9; Sirius at 21-22.

reasonable to assume that people will want to use licensed services while UWB devices are operational.

Sprint's MMDS network is designed to be an "always on" network. In addition, Sprint PCS and other CMRS providers are beginning to deploy 3G technologies that, among other things, will give customers "always on" connectivity (*e.g.*, so customers receive emails in a timely fashion). Thus, conflicts between MMDS equipment or PCS handsets and UWB devices could be continual. Similarly, landline business and residential gateways (*e.g.*, DSL, cable) are increasingly used in an "always on" mode, increasing the likelihood of interference with a mobile handset if a UWB LAN were used to distribute the signal throughout the premises.

Another important difference between conventional Part 15 devices and UWB devices is that conventional Part 15 devices' emissions are typically *narrowband*, while UWB devices would be designed to operate on a *wideband* basis. As Metricom correctly explains, "A UWB device would be allowed to spread its energy across an extremely wide bandwidth, subject to the same Part 15 limitation on average power in any 1 MHz bandwidth frequency range above 2 GHz. In effect, a UWB transmitter could therefore emit a radiation pattern similar to a large number of simultaneously operating narrowband Part 15 devices, each spaced 1 MHz apart. Whereas a narrowband Part 15 transmitter must be operating in close proximity **and** within the receiver bandwidth of a victim receiver in order to interfere with that receiver, a UWB device needs **only** to be operating in close proximity in order to interfere":

This is because a UWB device is likely to be emitting radiation within a victim receiver's bandwidth (because it is emitting radiation in nearly all

bandwidth), and depending on the characteristics of the UWB transmitter and receiver, could be virtually guaranteed to do so.¹⁷

The comments demonstrate that even for existing services operating on a narrow-band basis, the opportunity and probability of harmful interference from UWB devices is far greater than that of unintentional radiators or conventional Part 15 devices.¹⁸ As Nortel and others point out, the opportunity and probability of harmful interference from UWB devices is much greater with CDMA receivers that use wide bandwidths, because they are likely to receive more total energy in comparison to the emissions that can result from existing, narrowband Part 15 devices.¹⁹ This probability of UWB interference with wideband licensed services could worsen as carriers begin to use wider band software-defined radios and deploy third-generation CDMA technologies, whether 3XRTT (3.75 MHz channels) or W-CDMA (5 MHz channels).

The Commission was correct in concluding that UWB devices will not have the same effects as unintentional radiators or conventional Part 15 devices. Accordingly, there is no merit to the contention that UWB devices should be authorized using existing Part 15 emission levels. The purpose of the Part 15 emission levels is to ensure that Part 15 narrowband devices do not cause harmful interference. Because wideband UWB devices will result in an increased likelihood of interference, it necessarily follows that UWB devices must be subject to more rigorous emission limits.

¹⁷ Metricom at 4-5 (bold in original).

¹⁸ See Metricom at 3-5.

¹⁹ See, e.g., Nortel at 4-7.

IV. The Commission Should Regulate All UWB Emission Levels, Including Peak Emission Output

The Commission proposes to regulate the peak emission levels generated by UWB devices,²⁰ and most UWB proponents acknowledge that such “peak power” regulation is necessary. As one UWB proponent correctly observes:

Without peak limits, systems theoretically could be developed that meet the average limits, but have very low pulse repetition frequencies and, therefore, have enormous pulses.²¹

Because UWB devices would be designed to operate in spectrum bands that incumbent licensees use for their own authorized services, in most circumstances it is a UWB device’s peak emissions that will cause harmful interference.²²

The Commission proposes to authorize a UWB device to operate with a peak power that ranges from 20 to 60 dB, depending upon the total bandwidth of the device.²³ But as even UWB proponents acknowledge, the Commission provides “no justification for these values.”²⁴ In fact, the NPRM proposals are not reasonable on their face. As Metri-com documents, the proposed 60 dB maximum power limit would effectively allow in some instances a single UWB device to generate emissions equivalent to one thousand Part 15 devices.²⁵

²⁰ See *UWB NPRM* at ¶¶ 36 and 42.

²¹ Time Domain at 32.

²² See, e.g., Cisco Attachment 2, Analysis of UWB Signal Peaks into MMDS Receivers.

²³ See *UWB NPRM* at ¶ 43.

²⁴ Time Domain at 32.

²⁵ Metri-com, UWB NPRM Technical Appendix at 1 (“Allowing the maximum peak power to be 60 dB as proposed in the NPRM would effectively allow a single UWB device to look like a 1000 or more –41 dBm radiators spread across the band thus increasing the probability of interference to licensed receivers in close proximity to an operating UWB device.”).

The present method of using 1 MHz RBW and 10 KHz VBW might be adequate for average power measurements, but it is inadequate for measuring the peak power generated by UWB devices. Because of the disruptive effect that UWB emissions can have on existing services, it is imperative that the peak emissions of UWB devices be measured accurately and regulated appropriately.

V. The Commission Should Not Authorize UWB Devices Designed for the Mass Market Until the TAC-Recommended Noise Floor Study Is Completed

Eighteen months ago the Commission formed the Technological Advisory Council (“TAC”), comprising a diverse array of recognized technical experts, to provide “the technical expertise the Commission needs to stay abreast of innovations and new developments in the communications industry.”²⁶ One of the first tasks that the Commission assigned to the TAC was a preliminary assessment of the RF noise floor. The Commission noted a trend suggesting “a rising level of radiofrequency noise, perhaps attributable to the proliferation of consumer devices” and acknowledged that its understanding of this issue was both limited and based on dated information:

Given the dated nature of the Commission’s knowledge underlying those assumptions, as new and innovative radio communications devices emerge, *it is becoming increasingly important that the Commission base its decisions on a reliable assessment of the noise floor.* * * * As we head into the next millennium and as the Commission grapples with new and innovative communications technologies, it is essential that the Commission better understand the state of the current noise floor, the direction electromagnetic noise is headed in the overall environment, and the impact of radio emissions on the efficacy of telecommunications systems.²⁷

²⁶ Public Notice, “FCC Announces Formation of the Technological Advisory Council” (April 2, 1999).

²⁷ Official Requests from the FCC to the TAC, at 2-3 (May 12, 1999)(emphasis added), available at www.jacksons.net/tac/FCC Requests for the TAC.

The TAC immediately responded by commencing an investigation.²⁸ After reviewing the subject, the TAC determined that the Commission “needs to develop a more complete understanding of the current state of the radio noise environment”:

The issue is somewhat analogous to the characterization of air pollution. Knowledge is needed to determine if current rules are adequate, too restrictive, or overlooking an emerging crisis.²⁹

After further study, the TAC’s Noise Subcommittee expressed concern that “we could potentially be entering a period of rapid degradation of the noise environment” and that this degradation “could impact the reliability of current systems and the viability of future communications systems.”³⁰

Based on the trends in new wireless devices and systems, the subcommittee concluded that the noise environment may degrade significantly in the near future and therefore it warrants significant additional focus at this time.³¹

This “very serious emerging problem,” the Subcommittee explained, is caused by “the explosive growth of both intentional and unintentional radio sources.”³² Because of these concerns, the TAC unanimously recommended to the Commission in January 2000 that it undertake or support a study on electronic noise:

The TAC foresees that we could potentially be entering a period of rapid degradation of the noise environment. Such degradation would reduce our ability to meet the communications needs of the country. The principal

²⁸ See *Public Notice*, “Technological Advisory Council Requests White Papers” (July 1, 1999).

²⁹ Report: Second TAC Meeting, at § 5.5 (Oct. 28, 1999).

³⁰ TAC Noise Subcommittee Status (Nov. 30, 1999), available at www.jakcsn.net/tac

³¹ TAC Noise Subcommittee, Proposal for Noise Environment Assessment, at 2 (Nov. 24, 1999).

³² Report: Third TAC Meeting, at 1 (Jan. 3, 2000).

negative impacts are likely to be reductions in the performance or reliability of wireless systems or increases in their costs.³³

TAC advised the Commission of its belief that this issue is one of “urgency and importance” and recommended that the Commission should give the issue “a high priority.”³⁴

The Commission has since advised Congress that TAC’s concerns over the noise floor are legitimate, serious, and merit investigation.³⁵

UWB devices would add to the noise floor, perhaps dramatically in certain locations. One UWB proponent has predicted that its UWB chipsets could be integrated “into hundreds of applications in existing products” and that it alone could manufacture “over a billion chips per year.”³⁶ Given the substantial concern over the existing noise floor based on existing devices, now is not the time for the Commission to introduce entirely new products into the mass market that will only add to the noise floor. At a minimum, the Commission should defer approving UWB devices for the mass market until (a) the TAC-recommended noise floor study is completed, and (b) there is a better understanding of how mass-marketed UWB devices will contribute to the noise floor and how that contribution will impact existing services.³⁷

³³ Letter from Dr. Robert W. Luck, TAC Chairman, to the Hon. William E. Kennard, FCC Chairman, at 3 (Jan. 7, 2000).

³⁴ *Id.* at 2 and 3.

³⁵ See *FCC News*, FCC Chairman Delivers Report Card on the New FCC to Congress, Appendix (March 21, 2000); *FCC News*, Chairman Kennard Delivers to Congress Draft Strategic Plan for 21st Century (Aug. 12, 1999).

³⁶ See www.time-domain.com/Technology/ourtech_product.html, and Technology Access Report (March/April 1999), available at www.techaccess.com/pages/addinfo.html (quoting Time Domain).

³⁷ See, e.g., *New York Times*, “Preparing for a Collision Wireless Services” (April 27, 2000) (“If wireless networks proliferate as fast as many researchers predict, is it possible for the airwaves to become overloaded? Cell phones and some handheld organizers transmit and receive scores of

VI. The Commission Must Extend Its Restriction of UWB Devices Above 2 GHz

In the NPRM, the Commission justifiably expressed “significant concerns” over the operation of mass-marketed UWB devices in the spectrum bands below 2 GHz.³⁸ It did not, however, extend those concerns to spectrum bands above 2 GHz, based on its understanding that 1) high propagation losses at and above 2 GHz would enable UWB signals to quickly fall off below the background noise, and 2) existing radio services in bands higher than 2 GHz use directional rather than omni-directional antennas.³⁹ As several commenters point out, these assumptions are incorrect and UWB devices must be restricted both above and below 2GHz.

Sprint agrees with commenters urging the Commission to extend UWB interference protection to around 3 GHz.⁴⁰ Among the services to be protected are new technologies and advanced services such as two-way broadband Multichannel Multipoint Distribution Services (“MMDS”) and Instructional Television Fixed Services (“ITFS”), operating in the 2500-2690 MHz and 2150-2160 MHz bands, which the Commission has found serves critical needs of the public.

messages a day. With laptop computers and other devices added to the mix, will there eventually be one big wireless traffic jam?”).

³⁸ See *UWB NPRM* at ¶ 29.

³⁹ See *id.* at ¶ 27.

⁴⁰ See, e.g., AT&T Wireless at 7 (proposing a 2.6 GHz cutoff); GPS Council at 26-27 (proposing a 2.9 GHz cutoff); Mobile Communications Holdings at 2 (proposing a 3 GHz cutoff); Lockheed Martin at 8 (proposing a 2.9 GHz cutoff); Rockwell Collins at 5 (proposing a 5.15 GHz cutoff); Sirius at 7-15 (proposing a 2.9 GHz cutoff); XM Radio at 7-10 (proposing a 3 GHz cutoff); Multispectral Solutions at 13 (proposing a 3.1 GHz cutoff).

As demonstrated by Cisco and Sirius, the propagation characteristics of spectrum in the 2-3 GHz band are similar to those of spectrum below 2 GHz.⁴¹ Furthermore, as Cisco points out, the Commission's apparent assumptions about the impact of UWB interference on directional antennas are fundamentally incorrect.⁴² When an interfering signal from an UWB device falls within the beam of a directional antenna, the antenna will *magnify*, not reduce, the level of interference.⁴³ Moreover, this problem will be exponentially worse at MMDS/ITFS response hub sites that, in many cases, deploy multiple directional receive antennas in an omnidirectional pattern. Also, whereas the Commission appears to assume that "most radio services operating above 2 GHz use directional antennas," in fact, the Commission recently amended its rules to permit MMDS/ITFS operators to deploy omni-directional subscriber premises antennas.⁴⁴ The use of omnidirectional antennas in the marketplace is by no means speculative: the Commission has recognized that, when operated at low power, omni-directional antennas "can be placed on a desk or other convenient indoor location to provide high speed wireless internet access," and as such are "an appropriate and innovative use of [MMDS/ITFS] spectrum." Indeed, Sprint's MMDS service will use omni-directional antennas in the 2.5 GHz band. It therefore is

⁴¹ See, e.g., Cisco at 5; Sirius at 14.

⁴² Cisco at 5, quoting NPRM at ¶ 27.

⁴³ *Id.*

⁴⁴ *Amendment of Parts 1, 21, and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions (Report and Order on Further Reconsideration)*, MM Docket No. 97-217, FCC 00-244, at ¶¶ 34-35 (rel. July 21, 2000).

critical that the Commission accord MMDS/ITFS full protection from UWB interference, regardless of the types of antennas involved.⁴⁵

VII. The Commission Must Accommodate the Incumbent Licensee Interest in Financial Remuneration If It Decides to Permit Others to Use Spectrum Obtained at Auction and Cleared by Licensees

Sprint PCS paid the U.S. Treasury approximately \$3 billion for its PCS spectrum.⁴⁶ Sprint PCS paid this sizable fee with the understanding that its use of these PCS bands would be exclusive — that is, it *alone* would have the right to use these frequency bands within the designated BTA/MTAs during the term of the licenses:⁴⁷

The Commission's grant of a PCS license confers on the licensee an exclusive right to use the designated portion of the electromagnetic spectrum for the term of the license.⁴⁸

Sprint PCS also paid hundreds of millions of dollars to clear this PCS spectrum in order to provide its services.

[O]ur proposed regulatory scheme would require new [PCS] users to pay costs of [microwave] relocation as a condition of obtaining exclusive use of 2 GHz spectrum.⁴⁹

⁴⁵ Id. (Report and Order on Reconsideration), 14 FCC Rcd 12764, 12781 (1999).

⁴⁶ Much of Sprint's MMDS spectrum was also acquired through an auction. Sprint has invested over \$1 billion in MMDS licenses that will ultimately cover a total of 90 markets and an estimated 30 million households.

⁴⁷ The word "exclusive" is defined as "excluding or having power to exclude," "limiting or limited to possession, control, or use by a single individual or group," "excluding others from participation," or "restricted in distribution, use, or appeal because of expense." *Webster's New Collegiate Dictionary*, G. & C. Merriam Co. (1981).

⁴⁸ *Public Utility Commission of Texas*, 13 FCC Rcd 3460, 3503 ¶ 89 (1997). See also *BellSouth v. FCC*, 162 F.3d 1215, 1223 (D.C. Cir. 1999) ("CMRS spectrum is a finite resource and is also exclusive in that whatever one entity holds cannot be held by another.").

⁴⁹ *First Microwave Relocation Order*, 7 FCC Rcd 6886, 6889 ¶ 18 (1992).

Sprint PCS further expended additional billions constructing its sophisticated CDMA network — a network designed with the understanding that its use of the spectrum bands was exclusive and that no one else could use the spectrum (whether on a primary or secondary basis).

Given these facts, Sprint does not believe that the Commission can now allow others to use this same spectrum. However, even if it possesses the authority to change Sprint's PCS or MMDS licenses from exclusive to non-exclusive, the Commission certainly does not have the authority to permit others to use Sprint's spectrum for free or require Sprint to redesign its network to accommodate other users of its spectrum. This is particularly the case when the Commission is proposing to allow others to use Sprint's spectrum to provide telecommunications services that may compete with Sprint's own services.

Courts recognized even before licenses were auctioned that licensees hold a substantial, legally protected interest in their licenses. Indeed, the D.C. Circuit held shortly after the Communications Act was enacted that “the Act does definitively recognize the *rights* of license holders”:

It is equally apparent that the granting of a license by the Commission creates a highly valuable property right, which, while limited in character, nevertheless provides the basis upon which large investments of capital are made and large commercial enterprises are conducted. As it is the purpose of the Act to secure the use of the channels of radio communications by private licenses under a competitive system, those licensees must be protected in that use, not merely from unlicensed stations and unlicensed operators, but from improper activities of licensed stations and operators, and

from arbitrary action by the Commission, itself, in the exercise of its regulatory power.⁵⁰

These vested interests were recognized at a time when licenses were awarded for free. A licensee's legal interests are even more substantial where it pays the government for its license. Indeed, given that the federal government has received valuable (and sizable) consideration for issuing PCS and MMDS licenses, these licenses have effectively become a contract between the government and licensee. The Supreme Court has repeatedly held in recent years that the government becomes liable upon breach of contract — even when the contracting agency is prevented from honoring its bargain as a result of subsequent enactments of Congress.⁵¹

VIII. Conclusion

Unquestionably, UWB is a promising technology, but the fact remains that the UWB industry has yet to meet its burden of demonstrating that their proposed use of spectrum assigned to others will not cause harmful interference or that UWB applications cannot be accommodated using spectrum above 2.9 GHz. As discussed above, there are also serious legal issues that the Commission and courts must address before the Commission authorizes UWB, at least for mass market applications.

⁵⁰ *Yankee Network v. FCC*, 107 F.2d 212, 216-17 (D.C. Cir. 1939)(emphasis in original). See also *L.B. Wilson V. FCC*, 170 F.2d 793, 798 (D.C. Cir. 1948).

⁵¹ See, e.g., *Mobile Oil v. United States*, No. 99-244 (June 26, 2000)(Department of Interior breached oil lease contracts even though breach was caused by subsequent act of Congress); *United States v. Winstar*, 518 U.S. 839 (1996)(Government contractually liable for damages which arose when Congress amended the law, so as to deny certain savings and loans regulatory treatment to which the government had contractually committed itself); *Hughes Communications v. United States*, 998 F.2d 953 (Fed. Cir. 1993)(NASA financially responsible to satellite company for changes in policy triggered by sovereign government action).

For all the foregoing reasons, Sprint respectfully requests that the Commission take actions in this rulemaking that are consistent with the views expressed above and the views Sprint set forth in earlier comments and supplemental comments.

Respectfully submitted

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October 27, 2000

CERTIFICATE OF SERVICE

I, Anthony Traini, hereby certify on that on this 27th day of October 2000, I served a copy of the foregoing Sprint Reply Comments by U.S. first-class mail, or by hand delivery as indicated with an *, to the following persons:

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